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10/795,878

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EXAMINER

UHLLENHAKE, JASON S

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|-------------------------------------|--|
| Office Action Summary | Application No. 10/795,878 | Applicant(s) HUANG ET AL. | |
| | Examiner JASON S. UHLENHAK | Art Unit 2853 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 April 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11, 12, 15 and 19-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11, 12, 15 and 19-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda et al (U.S. Pat. 4,596,994) in view of Andrews et al (U.S. Pub. 2004/0085435) and Fouquet et al (U.S. Pat. 5,699,462)

Matsuda discloses:

- ***regarding claim 11***, a heating layer (2) on the substrate (1); a conductive layer (3) on the substrate, wherein the conductive layer conducts a current to the heating layer, and comprises a stepped portion used as a heating area, wherein the heating area is defined by the conductive layer and the heating layer (Figure 1; Column 4, Lines 36-64)
- a chamber (304) for storing liquid above the heating area, wherein the chamber includes a first side and a second side, the first side is overlapped with the heating area, the second side is connected to the first side, and the chamber is formed with an exit, from which the liquid is dispensed, on the second side (Figures 1, 3; Column 8, Lines 26-59)

Matsuda does not disclose expressly the following:

- **regarding claim 11**, a polymer disposed on the substrate; a porous material disposed on the polymer; and a chamber formed by the polymer and porous material, and the liquid flows into the chamber through the porous material

Andrews discloses:

- **regarding claim 11**, a adhesive disposed on the substrate; a porous material (316) disposed on the adhesive; and a chamber formed by the adhesive and porous material, and the liquid flows into the chamber through the porous material (Paragraph 0051-0052). Andrews also discloses that the filter can be bonded within the print head at various points along the ink flow path between the manifold and the nozzle (Paragraph 0013).

Andrews does not expressly disclose an adhesive polymer.

Fouquet discloses:

- **regarding claim 11**, Fouquet discloses using an adhesive polymer to bond multiple layers (Figure 14; Column 13, Lines 56-61) and that polymers are a known adhesive in the art. Andrews disclosed that "other adhesives" may be used (Paragraph 0051), therefore one of ordinary skill in the art would use an adhesive polymer to bond multiple layers

At the time the invention was made it would have been obvious to a person of ordinary skill in the art to provide a porous material in the chamber through which the liquid flows as taught by Andrews and to utilize an adhesive polymer to bond the porous material to the chamber as taught by Fouquet into the print head device of Matsuda, for the purpose of providing a filter which will prevent particles from entering the chamber.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda et al (U.S. Pat. 4,596,994) in view of Andrews et al (U.S. Pub. 2004/0085435) and Park et al (U.S. Pat. 6,702,428).

Matsuda discloses:

- ***regarding claim 19***, a heating layer (2) on the substrate (1); a conductive layer (3) on the substrate, wherein the conductive layer conducts a current to the heating layer, and comprises a stepped portion used as a heating area, wherein the heating area is defined by the conductive layer and the heating layer (Figure 1; Column 4, Lines 36-64)
- an adhesive layer disposed on the conductive layer (Column 8, Lines 40-44)
- a chamber (304) for storing liquid above the heating area, wherein the chamber includes a first side and a second side, the first side is overlapped with the heating area, the second side is connected to the first side, and the chamber is formed with an exit, from which the liquid is dispensed, on the second side (Figures 1, 3; Column 8, Lines 26-59)

Matsuda does not disclose expressly the following:

- ***regarding claims 19***, the porous material on the chamber so that the liquid flows into the chamber therethrough; a nozzle plate disposed on the second side of the chamber, including at least one orifice

Andrews discloses:

- **regarding claims 19**, the porous material (316) on the chamber (124) so that the liquid flows into the chamber therethrough (Figure 4; Abstract, Paragraphs 0051-52), for the purpose of providing a filter which will prevent particles from entering the chamber

Park discloses:

- **regarding claim 19**, a nozzle plate disposed on the second side of the chamber, including at least one orifice (Column 7, Lines 20-25), for the purpose of improving print performances such as a traveling property in a straight direction of ink droplets and ejection velocity of ink droplets (Abstract)

At the time the invention was made it would have been obvious to a person of ordinary skill in the art to utilize a nozzle plate on the second side of the chamber, including at least one orifice as taught by Park into the print head device as taught by Matsuda and Andrews, for the purpose of improving print performance and ejection velocity of ink droplets (Park: Abstract)

Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda et al (U.S. Pat. 4,596,994) in view of Andrews et al (U.S. Pub. 2004/0085435) and Inamoto et al (U.S. Pat. 4,609,427)

Matsuda discloses:

- **regarding claim 20**, a substrate (1); a heating layer (2) disposed on the substrate to dispense liquid

- a conductive layer disposed on the substrate to conduct a current to the heating layer, wherein the conductive layer comprises a stepped portion used as a heating area, wherein the heating area is defined by the conductive layer and the heating layer (Figure 1; Column 4, Lines 36-64)

- a metallic layer (401) disposed on the substrate; a chamber (304), formed by the metallic layer, having a first side and a second side, wherein the first side is overlapped with the heating area, the second side is connected to the first side, and the chamber is formed with an exit, from which the liquid is dispensed, on the second side, and the liquid flows into the chamber through the porous material (Figures 1, 3; Column 8, Lines 26-59)

- **regarding claim 21**, an adhesive layer disposed between the metallic layer and the porous material (Column 8, Lines 40-44)

Matsuda does not disclose expressly the following:

- **regarding claim 20**, a porous material disposed on the metallic layer

Andrews discloses:

- **regarding claim 20**, a porous material (Figure 4; Abstract, Paragraphs 0051-52), for the purpose of providing a filter which will prevent particles from entering the chamber

Inamoto discloses:

- **regarding claim 20**, a protective layer (3) (comprising metal) is coated on the substrate, for the purpose of protecting and using anti-corrosive metals (Figure 6; Column 3, Line 66 - Column 4, Line 11)

The combination of Matsuda, Andrews and Inamoto would result in a porous material disposed on the metallic layer (metallic layer is coated on the substrate)

At the time of the invention it would have been obvious to a person of ordinary skill in the art to utilizing a protective layer (comprising metal) and a porous material as taught by Inamoto and Andrews into the print head device of Matsuda, for the purpose of providing a filter which will prevent particles from entering the chamber and protecting and using anti-corrosive metals.

Claims 12, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda et al (U.S. Pat. 4,596,994) as modified by Andrews et al (U.S. Pub. 2004/0085435) and Fouquet et al (U.S. Pat. 5,699,462) as applied to claim 11 above, and further in view of Park et al (U.S. Pat. 6,702,428).

Matsuda as modified by Andrews and Fouquet discloses all of the claimed limitations except for the following:

- ***regarding claim 12***, wherein the chamber is light-sensitive polymer
- ***regarding claim 15***, a nozzle plate disposed on the second side of the chamber

Park et al discloses:

- ***regarding claim 12***, wherein the chamber is light-sensitive polymer (Column 6, Lines 50 – 67; Column 7, Lines 1 – 10), for the purpose of preventing delamination and improving ejection characteristics of the ink droplets.

- **regarding claim 15**, a nozzle plate disposed on the second side of the chamber Column 7, Lines 20-25), for the purpose of improving print performances such as a traveling property in a straight direction of ink droplets and ejection velocity of ink droplets (Abstract)

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate the teaching of Park et al into the device of Matsuda as modified by Andrews and Fouquet, for the purpose of preventing delamination and improving the ejection characteristics of the ink droplets.

Response to Arguments

Applicant's arguments with respect to claims 11-12, 15, 19-21 have been considered but are moot in view of the new ground(s) of rejection.

Regarding claim 1, it would be obvious to use an adhesive polymer in order to bond multiple layers (Please see above rejection). Applicant argues that Matsuda and Andrews do not disclose a chamber, formed by the polymer and porous material. However Andrews discloses that the filter can be bonded at various points along the ink flow path (Paragraph 0013), therefore when the filter is placed in the ink path (304) of Matsuda, a chamber will be formed starting at the placement of the filter and ending at the nozzle orifice (302)

Regarding claim 19, applicant argues that Matsuda and Andrews do not disclose a porous material disposed on the substrate, and includes a chamber. However Andrews discloses that the filter can be bonded at various points along the ink flow path

(Paragraph 0013), therefore when the filter is placed in the ink path (304, Figure 3) of Matsuda, a chamber will be formed starting at the placement of the filter and ending at the nozzle orifice (302)

Regarding claim 20, applicant argues the chamber formed by the metallic layer and the porous material is not disclosed by the prior art. However Andrews discloses that the filter can be bonded at various points along the ink flow path (Paragraph 0013) on the protective (metal) coating of the substrate (Inamoto; Figure 6; Column 3, Line 66 - Column 4, Line 11), therefore when the filter is placed in the ink path (304) of Matsuda, a chamber will be formed starting at the placement of the filter and ending at the nozzle orifice (302)

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Uhlenhake whose telephone number is (571) 272-5916. The examiner can normally be reached on Monday-Friday 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2853

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JASON S UHLENHAKE/
Examiner, Art Unit 2853

/Julian D. Huffman/
Primary Examiner, Art Unit 2853